General Specifications

US300PM
Ultrasonic Flowmeter, Portable type

GENERAL

US300PM is a portable type ultrasonic flowmeter that measures the flowrate in a pipe fully filled with liquid.

This flowmeter is used not only for the maintenance and the check of your facilities but also for the measurement at laboratories or manufacturing lines. The housing and the transducers are made for rough industrial environment.

The measuring principle is based on the influence of the flowing fluid to the travelling time of sound. The sound is transmitted through the pipe and the transit time difference between the forward and backward beams is used to determine the flow velocity (transit time method).

The measurement is non-intrusive. No cutting of the pipe is necessary. The measurement is independent of fluid pressure or conductivity. Owing to its clamp on transducers and a rechargeable battery the instrument is an ideal tool for service work.

For the hygienic measurement, there is no risk of contamination and suitable for ultra clean liquids as the transducers do not touch the liquid. Also, there is no risk of corrosion when used with aggressive media.

The instrument can work with up to two pairs of transducers. This enables you to measure the average flow for disturbed flow profile (two path measurement), the differential flow of two independent flows, or simply two different flows independently.

FEATURES

- Two channel inputs as standard
- Two current outputs maximum (The flow data and the sound speed in the liquid can be assigned at the same time)
- RS232 serial interface as standard
- Data storage memory about 100,000 values maximum
- Wall thickness measurement function as standard (probes are optional)
- Battery operation possible (14 hours maximum)
- Interactive setup menu for easy installation

STANDARD SPECIFICATIONS

GENERAL

Fluid
: Liquid (Turbidity < 10,000 mg/L, fluid sound speed 800 to 3500m/s)
Tolerance to entrained air and/or solids is strongly dependent upon pipe size and the size and distribution of the air bubbles and particles

Measured quanties
: Volume flow, mass flow (by setting density), flow velocity, sound speed in the fluid
Wall thickness of the pipe (when optional wall thickness probe is available)

Measuring principle
: Transit time method using ultrasonic signal

Pipe size
: 25 to 6500 mm

Pipe and lining material
: Carbon steel, Stainless steel, Grey cast iron, Ductile iron, Copper, Glass, PVC, etc

Flow velocity range
: 0.01 to 25 m/s

Resolution
: 0.025 cm/s

Accuracy
: 1% to 3% depending on application

Measuring cycle
: 100 to 1000 Hz (when only one channel input)

Straight pipe run in the upstream
: 10 to 50 diameters, depending on the kind of the flow disturbance

ULTRASONIC FLOWMETER (US300PM)

CONSTRUCTION

Housing material
: Aluminium (powder coated)

Water and dust-proof
: IP54 (EN60529)

Input

Number of input channels
: 2 (Channel A, Channel B).
Both transducers and wall thickness probe can be connected freely

Output

Current output
: 0 to 2 outputs
Range: 4 to 20mA
Flow velocity, volume flow, or sound speed in the liquid can be freely assigned

Frequency output
: 0 to 1 output
Range: 0 to 1kHz
Contact type: Open-collector, 24V/4mA
The value indicates instantaneous flow rate.

Binary output (pulse or alarm)
: 0 to 2 outputs
Contact type: Open-collector, 24V/4mA
The output values are selectable for each output.
The pulse outputs indicate the total volume flow (0.01 to 1000/unit) with pulse width 80 to 1000 ms.

Terminal type
: Banana plug terminals (+, -)

Display and Setting

LCD display
: 2x16 characters LCD with back light that can be switched on or off.
Two values can be displayed at the same time.

LED lamp
: SIGNAL lamp: Indicates the status of the measuring signal from each input channel (green or red light)
: BATTERY lamp: Indicates the status of battery voltage, etc.

Keyboard
: 15 keys (numeric and function keys). Easy operation by the interactive menu display

Display language
: Following languages selectable: Czech, Danish, Dutch, English, French, German, Norwegian, Polish, Turkey

Parameter setting storage function

Function
: Storage of pipe and fluid parameters (Maximum 80 different settings)
Storage of all parameters (Maximum 14 different settings)

Calculation function

Flow value
: Flow velocity
Volume flow or mass flow rate and totalization (both positive and negative flow totalization)

Sound velocity
: Sound velocity in the fluid

Wall thickness
: Wall thickness of the pipe possible using wall thickness probe (optional).
Transfer function of the measured thickness to the pipe parameter available

Calculation for the two flow inputs
: Two values from average, sum, or difference of the channel A and channel B inputs are available freely

Output assignment
: Calculated values above except for the wall thickness can be freely assigned to the actual outputs (two channel independent outputs available)

Output damping
: 0 to 100 seconds

Alarm

Alarm items
: High limit, low limit, flow direction change, quantity limit (for batch operation), error (measurement impossible)

Output hold type
: Non-hold or Hold

Output contact direction
: Normal Open or Normal Close

Data logging function

Function
: Store measured values in the internal memory

Memory size
: 27,000 values (standard)
100,000 values (optional)

Communication function

Type
: RS 232

Connector
: D-sub 9-pin connector, male

Function
: On-line/Off-line output of the measured values to personal computers or serial printers

Time-programmable measurement function

Function
: Automatic start and stop of the measurement using internal clock.
Can be used with data logging function or communication

Power supply

Power supply type
: Internal rechargeable battery (6V/4Ah) or power supply adapter (100 to 240VAC input, used also as battery charger)

Battery operating time
: Maximum 14 hours

Power consumption
: less than 15W

Safety and EMC standard

General safety
: EN61010 (CE marking)

EMC regulation
: EN61326 (CE marking)
AS/NZS 2064 (C-Tick mark)

Operating conditions

Ambient temperature
:-10 to +60 deg C

TRANSDUCERS(US300PT)

Type of usage

Dust and water-proof
: General purpose: IP65 (EN60529)
Immersible: IP67 (EN60529)

Pipe size type
: Medium size: 25 to 400 mm
Large size: 100 to 2500 mm
Very large size: 2000 to 6500 mm

Fluid temperature
: General temp. type: -30 to +130 deg C
High temp. type: -30 to +200 deg C

Construction

Case material
: Stainless steel

Contact surface material
: General temp. type: PEEK (Poly Ether Ether Keton)
High temp. type: Polyimid

Cable protection material
: Stainless flexible tube

Optional extension cable (US300PC)

Length : 5m, 10m, 20m
Use this when the length of the cable part of the transducers is not long enough

WALL THICKNESS PROBE

Type of usage

Fluid temperature
: General temp. type: -20 to +60 deg C
(option /WTG or model USPA301)
High temp. type: 0 to +200 deg C
(option /WTH or model USPA302)

Rating

Measuring range
: 1.0 to 200 mm (This depends on the material)

Resolution
: 0.01 mm

ACCESSORIES

Standard accessories for US300PM
: Transportation case
User's Manual
Measurement tape
Battery set (built-in in the main unit)

Others (fixing hardware, couplant, etc)
: Some are selectable in the model and suffix code (see next page) of the main unit or transducers, or separate orders are also possible

DATA TRANSFER SOFTWARE

Function
: Download and upload of the parameters or download of logging data via RS232 communication port

Standard accessories
: RS232 cable and RS232 adapter 9/25

Operating system
: Windows 95, 98, ME, NT, 2000

Language
: English / German version

MODEL AND SUFFIX CODE

Ultrasonic flowmeter, portable type

Model	Suffix code	Specification
US300PM.	. . . . .	Ultrasonic flowmeter, portable type
Output	-A0.	No current output
	-A1.	One current output
	-A2.	Two current outputs
Power Supply Adapter and AC cable	1.	Japan
	2.	USA
	3.	Europe
	4.	United Kingdom
	5.	Australia
	6.	South Africa
	-2.	Always 2
	-N.	Always N
Option	/PU1.	One binary (pulse or alarm) output (open-collector) (Note)
	/PU2.	Two binary (pulse or alarm) outputs (open-collector) (Note)
	/FQ1.	Frequency output (open-collector, 0 to 1kHz)
	/DLX.	Data logging extension (100,000 values)
	/BGT.	Tag number on the nameplate (in the nameplate label, maximum 16 characters)
	/WTG.	Wall thickness probe for general temperature (-20 to +60 deg C)
	/WTH.	Wall thickness probe for high temperature (0 to +200 deg C)

(Note) Option /PU1 and /PU2 are exclusive.

Optional extension cable for portable type

Model	Suffix code	Specification
US300PC.	. . . . .	Optional extension cable for portable type
Length	-A005.	Cable length 5[m]
	-A010.	Cable length 10[m]
	-A020.	Cable length 20[m]

Data transfer software

Model	Suffix code	Specification
US300SA.	. . . . .	Data transfer software (Windows versions) Including connecting kit (RS 232 cable for connection with IBM-PC, RS 232 adapter 9/25)
Language	-1.	English / German version
	00.	Always 00

Transducers for portable type

Model	Suffix code	Specification
US300PT.	. . . . .	Transducers for portable type
Usage	-G.	General purpose (IP65)
	-W.	Waterproof (IP67)
Pipe Size / Fluid Temperature	BG.	Medium & General (with 3m cable) (Note)
	BH.	Medium & High (with 3m cable) (Note)
	CG.	Large & General (with 4.4m cable) (Note)
	CH.	Large & High (with 4.4m cable) (Note)
	DG.	Very large & General (with 12m cable) (Note)
		(Note) B: Medium size (25 to 400mm) C: Large size (100 to 2500mm) D: Very large (2000 to 6500mm) G: General temp. (-30 to +130 deg C) H: High temp. (-30 to +200 deg C)
Mounting fixture	-C	Chain retaining clip (set of two)
	-S	Standard type (set of two blocks, including ruler marked length 330mm)
	-M	Magnetic type for general temp. (-30 to +100 deg C, set of two blocks, including ruler marked length 330mm)
	-N	None
Fixing chain	B.	For 25 to 1200mm Fixing chains (1 x 2) Extensional fixing chains (1 x 2)
	C.	For 1200 to 3000mm Fixing chains (1 x 2) Extensional fixing chains (4 x 2)
	D.	For 3000 to 6500mm Fixing chains (1 x 2) Extensional fixing chains (10 x 2)
	N.	None
Acoustic couplant	G. . .	General temperature type (-30 to +130 deg C)
	H. . .	High temperature type (-30 to +200 deg C)
	N. . .	None
Option	TTP	Transducer tag plate (maximum 16 characters)

ACCESSORIES (for the ultrasonic flowmeter US300PM)

Model	Description
USPA301	Wall thickness probe for general temperature (-20 to 60 deg C)
USPA302	Wall thickness probe for high temperature (0 to 200 deg C)
USPA311	Power supply adapter (100 to 240 V AC input)
USPA321	AC cable (Japan)
USPA322	AC cable (USA)
USPA323	AC cable (Europe)
USPA324	AC cable (United Kingdom)
USPA325	AC cable (Australia)
USPA326	AC cable (South Africa)
USPA331	Battery set (6V 4Ah)
USPA341	Transportation case

ACCESSORIES (Others)

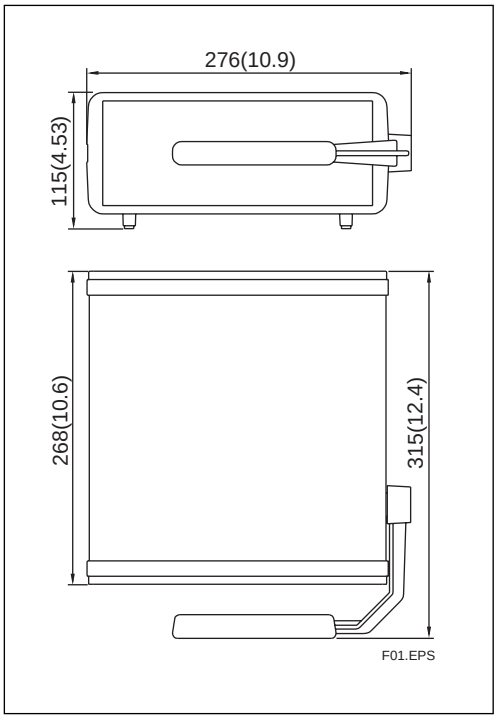
Model	Description
USPA401	RS 232 cable
USPA402	RS232 adapter 9/25
USPA411	Measuring tape

ACCESSORIES (for transducers US300PT)

Model	Description
USPA001	Fixing strap (10m length)
USPA002	Fixing strap (20m length)
USPA011	Fixing clips (medium type, for pipe size 40 to 100mm, set of two clips)
USPA012	Fixing clips (large type, for pipe size 100 to 6500mm, set of two clips)
USPA021	Fixing band (only for pipe size 25 to 50mm)
USPA032	Fixing chain (and extension) (2m length, one required for each 600mm diameter)
USPA033	Repair set for fixing chain
USPA034	Fixing Chain Retaining Clips set of two (for use with USPA032)
USPA054	Mounting fixture standard type (for transducers medium pipes size type, temperature -30 to +200 deg C set of two blocks)
USPA055	Mounting fixture magnetic general temperature type (for transducers medium pipe size type, temperature -30 to +100 deg C set of two blocks)
USPA057	Mounting fixture standard type (for transducers large or very large pipe size type, temperature -30 to +200 deg C set of two blocks)
USPA058	Mounting fixture magnetic general temperature type (for transducers large or very large pipe size type, temperature -30 to +100 deg C set of two blocks)
USPA073	Additional magnets for mounting fixture magnetic general temperature type (for transducers medium pipe size type, temperature -30 to +100 deg C set of two magnets)
USPA075	Additional magnets for mounting fixture magnetic general temperature type (for transducers large or very large pipe size type, temperature -30 to +100 deg C set of two magnets)
USPA081	Ruler for mounting fixture (marked length 120mm)
USPA082	Ruler for the mounting fixture (marked length 330mm)
USPA091	Acoustic couplant for general temperature (100g, -30 to +130 deg C)
USPA092	Acoustic couplant for general temperature (100g, -30 to +200 deg C)

DIMENSIONAL DRAWINGS

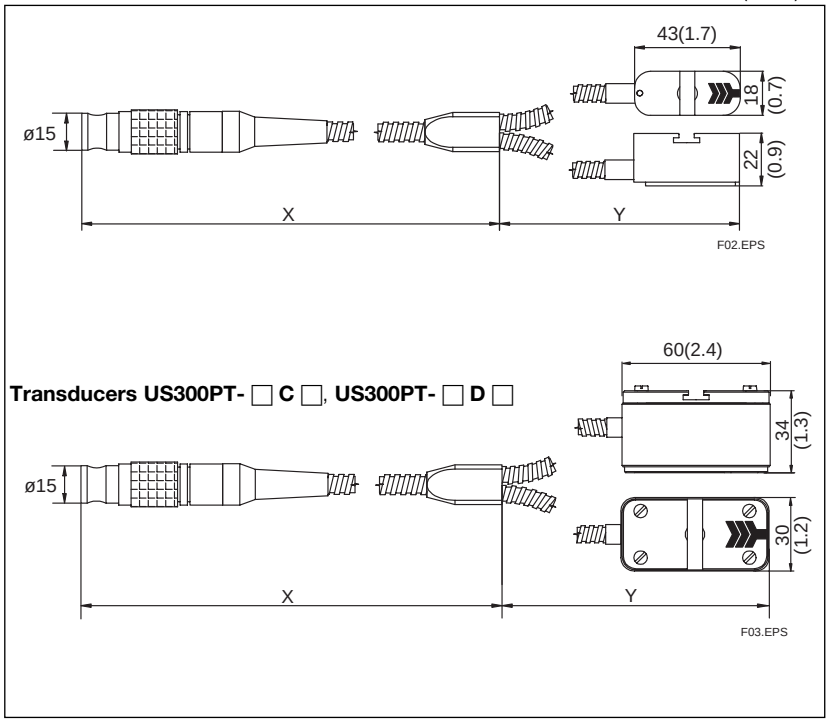
Ultrasonic Flowmeter US300PM



Weight: 3.9kg (8.60lb)
(incl. battery set)

Transducers US300PT-☐B☐

Unit: mm (inch)



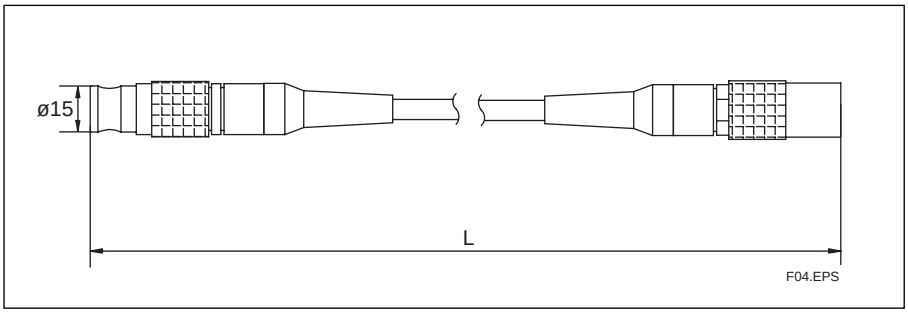
Transducers US300PT-☐C☐, US300PT-☐D☐

Length

Transducers	X m (inch)	Y m (inch)	X+Y m (inch)	Weight kg (lb)
US300PT-☐B☐	2.0 (78.7)	1.0 (39.4)	3.0 (118.1)	0.6 (1.32)
US300PT-☐C☐	2.0 (78.7)	2.4 (94.5)	4.4 (173.2)	1.2 (2.65)
US300PT-☐D☐	5.0 (196.9)	7.0 (275.6)	12.0 (472.4)	2.2 (4.85)

T08.EPS

Optional Extension Cable US300PC-A☐☐☐



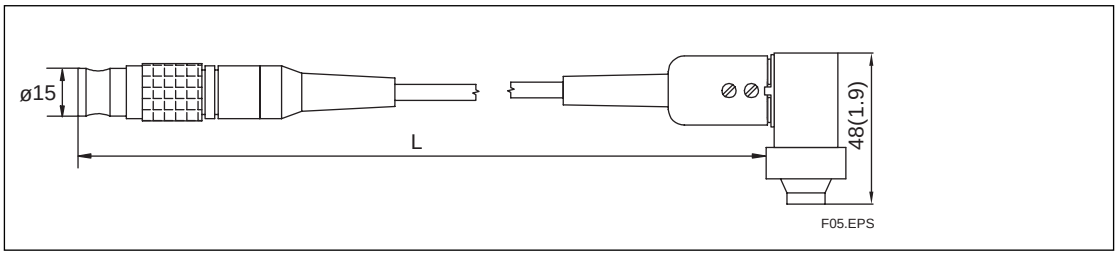
Length

Optional extension cable	L m (inch)	Weight kg (lb)
US300PC-A005	5.0 (196.9)	0.4 (0.88)
US300PC-A010	10.0 (393.7)	0.6 (1.32)
US300PC-A020	20.0 (787.4)	1.6 (3.53)

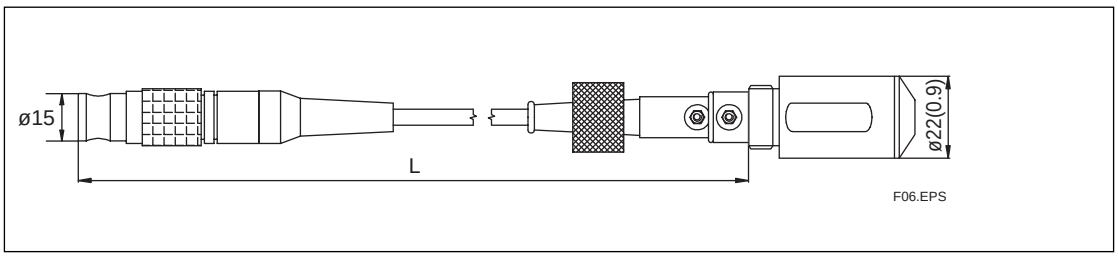
T09.EPS

Wall Thickness probe for general temperature (-20 to + 60 deg C)
(option /WTG or model USPA301)

Unit: mm (inch)



Wall Thickness probe for high temperature (0 to + 200 deg C)
(option /WTH or model USPA302)



Wall thickness probe	L m (inch)	Weight kg (lb)
/WTG or USPA301	1.5 (59.1)	0.17 (0.37)
/WTH or USPA302	1.2 (47.2)	0.19 (0.42)

T10.EPS

Ordering Information
Specify the following when ordering

1. Model, suffix and option code
(1) First, specify the main unit US300PM and the transducers US300PT (one pair of transducers when using only one channel or two pairs when using two channels). The transducers can be added later.
(2) Specify the wall thickness probe if necessary in the option code for the main unit US300PM (code /WTG or /WTH). They can be purchased later as model USPA301 or USPA302.
(3) Specify the optional extension cable if necessary.
(4) Specify the accessories when necessary or suitable. For example we can use "fixing strap" instead of "fixing chain" to fix the transducers to the pipe. Please consult us for the details.

2. Tag number (when necessary)
Maximum sixteen (16) characters for the cases below.
(1) In the nameplate of the main unit US300PM (necessary to specify the option /BGT at the same time)
(2) In the tag plate for the transducers US300PT (necessary to specify the option /TTP at the same time)

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